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Fermi Observations of Gamma-ray Pulsars

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A year and a half after Fermi was launched, the number of known gamma-ray pulsars has increased dramatically. For the first time, a sizeable population of pulsars has been discovered in gamma-ray data alone. For the first time, millisecond pulsars have been confirmed as powerful sources of gamma-ray emission, and a whole population of these objects is seen with the LAT. The remaining gamma-ray pulsars are young pulsars, discovered via an efficient collaboration with radio and X-ray telescopes. It is now clear that a large fraction of the nearby energetic pulsars are gamma-ray emitters, whose luminosity grows with the spin-down energy loss rate. Many previously unidentified EGRET sources turn out to be pulsars. Many of the detected pulsars are found to be powering pulsar wind nebulae, and some are associated with TeV sources. The Fermi LAT is expected to detect more pulsars in gamma rays in the coming years, while multi-wavelength follow ups should detect Fermi-discovered pulsars. The data already revealed that gamma-ray pulsars generally emit fan-like beams sweeping over a large fraction of the sky and produced in the outer magnetosphere.

[1]On behalf of the Fermi-LAT Collaboration.